Name: Date:

Polynomial Factoring solution (version 625)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 24 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(24)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 96}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-32}}{2}$$

$$x = \frac{8 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{8 \pm 4\sqrt{2}\, i}{2}$$

$$x = 4 \pm 2\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $3 + 7i$ and $-6 - 8i$ in standard form $(a + bi)$.**

Solution

$$(3 + 7i) \cdot (-6 - 8i)$$

$$-18 - 24i - 42i - 56i^2$$

$$-18 - 24i - 42i + 56$$

$$-18 + 56 - 24i - 42i$$

$$38 - 66i$$

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3. **Write function $f(x) = x^3 - 3x^2 - 22x + 24$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	-3	-22	24
6		6	18	-24
	1	3	-4	0

$$f(x) = (x-6)(x^2+3x-4)$$

$$f(x) = (x-6)(x-1)(x+4)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+5)^2 \cdot (x+2)^2 \cdot (x-2)$$

Sketch a graph of polynomial $y = p(x)$.